In The Claims

Cancel claims 1-90.

Add new claims 91-149 as follows:

-- 91. (NEW) An *in vitro* process for producing more than one copy of a specific nucleic acid, said process being independent of a requirement for the introduction of an intermediate structure for the production of said specific nucleic acid, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) nucleic acid precursors,

(ii) one or more specific nucleic acid primers each of which is complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a nucleic acid producing catalyst; and

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing more than one copy of said specific nucleic acid. --

-- 92. (NEW) The process of claim 91 wherein said specific nucleic acid is single-stranded or double-stranded. --

-- 93. (NEW) The process of claim 91 wherein said specific nucleic acid is selected from deoxyribonucleic acid, ribonucleic acid, a DNA:RNA hybrid or a polymer capable of acting as a template for a nucleic acid polymerizing catalyst. --

-- 94. (NEW) The process of claim 91 wherein said specific nucleic acid is in solution. --

-- 95. (NEW) The process of claim 94 further comprising the step of treating said specific nucleic acid with a restriction enzyme capable of producing blunt-ends. --

-- 96. (NEW) The process of claim 91 wherein said specific nucleic acid is isolated or purified prior to the contracting step (b) or the reacting step (c). --

-- 97. (NEW) The process of claim 96 wherein said isolation or purification of said specific nucleic acid is carried out by means of sandwich hybridization or capture sandwich hybridization. --

-- 98. (NEW) The process of claim 97 further comprising the step of releasing said isolated or purified specific nucleic acid that was captured by means of sandwich hybridization or capture sandwich hybridization. --

-- 99. (NEW) The process of claim 98 wherein said releasing step is carried out by means of a restriction enzyme. --

-- 100. (NEW) The process of claim 91 wherein said nucleic acid precursors are selected from nucleoside triphosphates and nucleoside trisphosphate analogs, or a combination thereof. --

-- 101. (NEW) The process of claim 100 wherein said nucleoside triphosphates are selected from deoxyadenosine 5'-triphosphate, deoxyguanosine 5'-triphosphate, deoxythymidine 5'-triphosphate, deoxycytidine 5'-triphosphate, adenosine 5'-triphosphate, guanosine 5'-triphosphate, uridine 5'-triphosphate and cytidine 5'-triphosphate, or a combination of any of the foregoing. --

-- 102. (NEW) The process of claim 100 wherein said nucleoside triphosphate analogs are naturally occurring or synthetic, or a combination thereof. --

-- 103. (NEW) The process of claim 100 wherein at least one of said nucleoside triphosphates or nucleoside triphosphate analogs is modified on the sugar, phosphate or base. --

-- 104. (NEW) The process of claim 91 wherein said specific nucleic acid primers are selected from deoxyribonucleic acid, ribonucleic acid, a DNA.RNA copolymer,

or a polymer capable of hybridizing or forming a base-specific pairing complex and initiating nucleic acid polymerization. --

-- 105. (NEW) The process of claim 91 wherein said specific nucleic acid primers comprise oligo- or polynucleotides. --

-- 106. (NEW) The process of claim 91 wherein said specific nucleic acid primers contain a 3'-hydroxyl group or an isosteric configuration of heteroatoms. --

-- 107. (NEW) The process of claim 106 wherein said heteroatoms are selected from nitrogen, sulfur, or both. --

-- 108. (NEW) The process of claim 91 wherein said specific nucleic acid primers are not substantially complementary to one another. --

-- 109. (NEW) The process of claim 108 wherein said specific nucleic acid primers contain no more than five complementary base-pairs in the sequences therein. --

-- 110. (NEW) The process of claim 91 wherein said specific nucleic acid primers comprise from about 5 to about 100 nucleotides. --

-- 111. (NEW) The process of claim 110 wherein said specific nucleic acid primers comprise from about 8 to about 20 nucleotides. --

-- 112. (NEW) The process of claim 91 wherein said specific nucleic acid primers comprise at least one non-complementary nucleotide or nucleotide analog base, or at least one non-complementary sequence thereof. --

-- 113. (NEW) The process of claim 112 wherein said specific nucleic acid primers further comprise from about 1 to about 200 noncomplementary nucleotide or nucleotide analogs. --

-- 114. (NEW) The process of claim 113 wherein said noncomplementary nucleotide or nucleotide analogs in said specific nucleic acid primers comprise from about 5 to about 20 nucleotides. --

-- 115. (NEW) The process of claim 112 wherein said noncomplementary base sequence or sequences are linked together by other than a phosphodiester bond. --

-- 116. (NEW) The process of claim 91 wherein said nucleic acid producing catalyst is selected from DNA polymerase and reverse transcriptase, or both. --

-- 117. (NEW) The process of claim 91 wherein said nucleic precursors or said specific primers or both of said nucleic acid precursors and said specific primers are modified by at least one intercalating agent. --

-- 118. (NEW) The process of claim 91 further comprising the step (d) of detecting the product produced in step (c). --

-- 119. (NEW) The process of claim 118 wherein said detecting step (d) is carried out by means of incorporating into the product a labeled primer, a labeled precursor, or a combination thereof. --

-- 120. (NEW) The process of claim 91 further comprising the step of regenerating said one or more specific nucleic acid primers for additional production processes. --

-- 121. (NEW) An *in vitro* process for producing more than one copy of a specific nucleic acid, said products being substantially free of any primer-coded sequences, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) nucleic acid precursors,

(ii) one or more specific polynucleotide primers comprising at least one ribonucleic acid segment each of which primer is substantially complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a nucleic acid producing catalyst; and

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing substantially or all primer-coded sequences from the product produced in step (c) to regenerate a primer binding site, thereby allowing a new priming event to occur and producing more than one copy of said specific nucleic acid. --

-- 122. (NEW) The process of claim 121 wherein said step (d) removing is carried by digestion with an enzyme. --

-- 123. (NEW) The process of claim 122 wherein said enzyme comprises ribonuclease H. --

-- 124. (NEW) The process of claim 121 wherein said nucleic acid precursors are modified or unmodified. --

-- 125. (NEW) The process of claim 121 wherein said specific polynucleotide primers further comprise deoxyribonucleic acid. --

-- 126. (NEW) The process of claim 121 wherein said specific polynucleotide primers contain a 3'-hydroxyl group or an isosteric configuration of heteroatoms. --

-- 127. (NEW) The process of claim 126 wherein said heteroatoms are selected from nitrogen, sulfur, or both. --

-- 128. (NEW) The process of claim 121 wherein said specific polynucleotide primers further comprise from about 1 to about 200 noncomplementary nucleotide or nucleotide analogs. --

-- 129. (NEW) An *in vitro* process for producing more than one copy of a specific nucleic acid, said products being substantially free of any primer-coded sequences, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) unmodified nucleic acid precursors,

(ii) one or more specific chemically-modified primers each of which primer is substantially complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a nucleic acid producing catalyst; and

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing substantially or all primer-coded sequences from the product produced in step (c) to regenerate a primer binding site, thereby allowing a new priming event to occur and producing more than one copy of said specific nucleic acid. --

-- 130. (NEW) The process of claim 129 wherein said step (d) removing is carried by digestion with an enzyme. --

-- 131. (NEW) The process of claim 130 wherein said enzyme comprises ribonuclease H. --

-- 132. (NEW) The process of claim 129 wherein said specific chemically modified primers are selected from ribonucleic acid, deoxyribonucleic acid, a DNA.RNA copolymer, and a polymer capable of hybridizing or forming a base-specific pairing complex and initiating nucleic acid polymerization, or a combination of any of the foregoing. --

-- 133. (NEW) The process of claim 129 wherein said specific chemically modified primers contain a 3'-hydroxyl group or an isosteric configuration of heteroatoms. --

-- 134. (NEW) The process of claim 133 wherein said heteroatoms are selected from nitrogen, sulfur, or both. --

-- 135. (NEW) The process of claim 129 wherein said specific chemically modified primers are selected from nucleoside triphosphates and nucleoside triphosphate analogs, or a combination thereof, wherein at least one of said nucleoside triphosphates or analogs is modified on the sugar, phosphate or base. --

-- 136. (NEW) The process of claim 129 wherein said specific chemically modified primers further comprise from about 1 to about 200 noncomplementary nucleotide or nucleotide analogs. --

-- 137. (NEW) An *in vitro* process for producing more than one copy of a specific nucleic acid, said products being substantially free of any primer-coded sequences, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:
  (i) unmodified nucleic acid precursors,
  (ii) one or more specific unmodified primers each of which primer comprises at lease one non-complementary sequence to a distinct sequence of said specific nucleic acid, such that upon hybridization to said specific nucleic acid at least one loop structure is formed, and
  (iii) an effective amount of a nucleic acid producing catalyst; and

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing substantially or all primer-coded sequences from the product produced in step (c) to regenerate a primer binding site, thereby allowing a new priming event to occur and producing more than one copy of said specific nucleic acid. --

-- 138. (NEW) The process of claim 137 wherein said step (d) removing is carried by digestion with an enzyme. --

-- 139. (NEW) The process of claim 138 wherein said enzyme comprises ribonuclease H. --

-- 140. (NEW) The process of claim 137 wherein said specific unmodified primers are selected from ribonucleic acid, deoxyribonucleic acid, a DNA.RNA copolymer, and a polymer capable of hybridizing or forming a base-specific pairing complex and initiating nucleic acid polymerization, or a combination of any of the foregoing. --

-- 141. (NEW) The process of claim 137 wherein said specific unmodified primers further comprise from about I to about 200 noncomplementary nucleotide or nucleotide analogs. --

-- 142. (NEW) An *in vivo* process for producing a specific nucleic acid, said process comprising the steps of:

(a) providing a conjugate comprising a protein-nucleic acid construct, said conjugate being capable of producing a nucleic acid when present in a cell; and

(b) introducing said conjugate into a cell, thereby producing said specific nucleic acid. --

-- 143. (NEW) The process of claim 142 wherein said construct comprises at least one promoter. --

-- 144. (NEW) The process of claim 142 wherein said construct comprises at least one complementary sequence to a sequence of a primer present in the cell. --

-- 145. (NEW) The process of claim 142 wherein said nucleic acid construct codes for the production of a protein in said conjugate. --

-- 146. (NEW) The process of claim 142 wherein said nucleic acid construct codes for a protein other than the protein in said conjugate. --

-- 147. (NEW) The process of claim 146 wherein said other protein comprises a nucleic acid polymerase. --

-- 148. (NEW) The process of claim 147 wherein said polymerase comprises an RNA polymerase and said nucleic acid construct comprises a promoter for said RNA polymerase. --

-- 149. (NEW) The process of claim 147 wherein said polymerase comprises a DNA polymerase or reverse transcriptase. --

* * * * * * *